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## Multi-Frequency Code Signalling in the Swiss Telephone System

W. Zach, Berne

Switzerland is introducing a multi-frequency code signalling system offering far better reliability, speed and flexibility than the currently used pulse signalling systems. A general description is given together with details of application and special features.

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## Performance of SDM Telephone Exchanges – New Concept for Processor Control

R. P. Loréan, Colchester

The author first comments on the availability and reliability of telephone switching systems and outlines established test procedures as well as switching network control. Existing systems are compared and their operational safety is discussed. The second part deals with the possibilities to obtain improved characteristics and introduce new services. A new system of distributed control is outlined and future developments are touched on.

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## Nomograms for the Rapid Determination of the Reduction Factor of Cable Armouring

P. Benoît, Cortailod

When evaluating a cable armouring or designing a cable system influenced by leaking currents, a quick way of determining the magnitude of the reduction factor is essential. A simple method of calculation based on general nomograms is outlined in this article. Thanks to this method the makeup of a cable armouring can be determined rapidly when the system has to be altered or a new installation has to be projected. Comparison of different types of design and the assessment of the consequences of changing the physical armouring parameters are likewise possible.

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## Ground Networks of Zinc-coated Copper Strip (2nd part)

A. Brunold, Berne

See summary in last issue, p. 382.

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## Postal Engineering in Telecommunications

H. R. Lerch, Berne

The Swiss PTT Postal Engineering Division has designed and built a number of labour-saving conveyer systems tailored to

the specific needs of posts and telecommunications. These systems are, or will be, contributing to effective rationalization and efficient running of services. The article describes some of the installations to illustrate the Division's manifold duties and the importance attached to its work.

## News Items

### Posts

Efforts by Swiss PTT to rationalize mail delivery include the publicity for post office boxes. The campaigns conducted over the last few years have been quite successful, with the number of boxes rising from 82,005 in 1968 to 110,246 at the end of 1973. The largest increases were noted in the four conurbations of Zurich (115%), Geneva (75%), Berne (64%) and Basle (48%). Last year, 24% of the letter post items (including newspapers) and 34.5% of the parcel post items were delivered to p.o. boxes.

In 1973, 51 million Swiss Postbus passengers travelled 512 million kilometres, an average of 10 km per person. The services were used for individual travel by 45%, for commuting by 50% and for group travel by 5% of the passengers.

### Telephone

In 1973, Swiss subscribers spent an average of 406 francs on telephone conversations. Inland trunk calls accounted for 230 francs, international calls for 126 francs and local calls for 50 francs.

Swiss manual offices no longer handle calls to some countries that can be dialled direct by the subscribers (German Federal Republic, Austria, the United Kingdom, the Benelux countries, Scandinavia as well as parts of France and Italy). Preavis and collect calls to Germany and Austria, as well as notification of duration and charges for calls to all of the above countries, have also been discontinued. These restrictions were introduced on 15 October to ensure the continuation of essential manual services despite severe staffing difficulties.

The Berne-Shanghai radio telephone channel has been equipped with Lincompex, which is now available on over two thirds of Switzerland's international radio links.

In the 18-month interval between publication of the 1972/73 and 1974/75 editions of the Swiss telephone directory the PTT flexoprint office handled 237,000 new entries as well as 706,000 cancellations and changes of address, owner or number. This corresponds to an average daily batch of about 2,600 entries.

## Radio, Television

The frequency offset arrangement between the medium-wave transmitters of Ain Beida (Algeria) and Beromünster (Switzerland) has had to be abandoned because of a technical defect in the Algerian station. Both transmitters are again operating on 529 kHz, and Switzerland has had to increase its output power in the evening and night hours to overcome the effects of interference.

## Miscellaneous

In the first half of 1974, 59 Swiss PTT buildings were completed. On 1 July, 127 buildings were under construction, 40 had reached the final planning stage, and design work on another 413 was in hand.

Representatives of France and Switzerland met at Basle in August to discuss an extension of telecommunication facilities between the two countries. It was agreed to convert to 12 MHz working the coaxial cables Basle-Mulhouse, Neuchâtel-Besançon, Geneva-Annemasse, and to increase the capacity of the Geneva-Lyon microwave link as well as that of the Geneva-Gex frontier cable by 1980.

The 20th simplex relay for Switzerland's mobile radiophone service, which is operated independent of the public network, has come into operation near Lucerne.

Fred Air AG of Zug and Ciba-Pilatus AG of Stans have joined the Swiss PTT Short-wave Radiophone Service with Aircraft, which enables operational messages to be exchanged between pilots and the home airport.

A Swiss PTT Telecommunications delegation has paid a return visit to the People's Republic of China. It has been agreed to open a satellite circuit between Berne and Shanghai in addition to the existing radio link.

Each year Swiss PTT arranges a large number of training courses for its engineers, technicians and maintenance personnel to enable them to keep abreast of the rapid technical development in telecommunications and to familiarize them with the functioning, operation and maintenance of an increasing range of sophisticated equipment. The courses, which are conducted in the major towns, provide both basic knowledge and practical application. Programmed instruction on the basis of PTT teaching material is being successfully used for training maintenance engineers. The general courses on electrical engineering and electronics are designed to encourage active learning and individual experimenting, for which building sets are provided.